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## Bark Beetles of Pine

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## Ips Beetles

Many species of ips beetles (also called engraver beetles) attack pine. Common species in Nebraska include *Ips pini*, *I. calligraphus* and *I. grandicollis*. Ips beetles are less aggressive than mountain pine beetle, preferring freshly cut wood, logging slash or wind-thrown trees to standing pines. Beetles emerging from this material may attack nearby trees, especially young, drought-stressed pines and the branches or tops of larger trees. Fire-damaged trees are also susceptible.



**Hosts:** Ponderosa pine is commonly attacked. All pines are susceptible to one or more species.

**Life Cycle:** Ips beetles begin emerging in early spring. Adults tunnel into branches or trunks, producing sawdust but rarely pitch tubes. Tunnels are constructed beneath the bark in a Y, X or H pattern. Larvae hatch from eggs laid along the tunnels and excavate smaller tunnels leading from the main tunnel. Succeeding generations of adults may attack nearby trees, uninfested portions of the same tree or freshly cut wood or slash. Two or more generations occur per year.



Y-shaped tunnel below the bark.

### Management:

- ✓ Improve tree health by thinning dense stands.
- ✓ Scatter, crush or chip slash to hasten drying and reduce its suitability for ips development.
- ✓ Thoroughly water landscape and windbreak trees during periods of drought. Apply 1 inch of water per week (up to 2 inches on sandy soils), and water no more than twice a week.
- ✓ Avoid digging, trenching, compacting the soil or other activities that damage roots.
- ✓ Avoid placing freshly cut wood near pines.
- ✓ Treat high-value trees with an insecticide. See back panel for more information.

## Insecticides

Only insecticides specifically formulated and labeled for bark beetles will give effective control, and treatment generally must be done by a licensed applicator. For mountain pine beetle, apply as a drenching spray to the entire trunk below a diameter of 4 inches. For red turpentine beetle, apply to the lower 6 to 8 feet of the trunk. For ips beetles, spray the entire trunk and branches.

Insecticide <sup>1</sup>	Mountain pine & Red turpentine beetles	
		Ips beetles
<b>carbaryl</b> <i>Sevin XLR Plus</i> <i>Sevin SL</i>	apply by mid-June	apply in spring (March or April)
<b>permethrin</b> <i>Astro</i>	apply by mid-June	apply in March and July
<b>bifenthrin</b> <i>Onyx</i>	apply by mid-June	apply in March and July

<sup>1</sup>Trade names are examples of available products. No endorsement is implied. Always follow pesticide label instructions.

The following photos are courtesy of Bugwood.org:  
 Trees killed by MPB: Whitney Cranshaw, Colorado State University  
 MPB adult: USDA Forest Service, Rocky Mountain Region archive  
 Red turpentine beetle adult: Joseph Berger  
 Ips beetle adult: Ladd Livingston, Idaho Dept. of Lands  
 Red turpentine pitch tubes: Bob Oakes/Kenneth E. Gibson, USDA Forest Service  
 Ips top-killed tree: William M. Ciesla, Forest Health Management International  
 Ips tunnels: David McComb, USDA Forest Service

Laurie Stepanek, Nebraska Forest Service  
 For more information: [www.nfs.unl.edu](http://www.nfs.unl.edu)



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## Bark Beetles of Pine

*including:*

**Mountain pine beetle**  
**Red turpentine beetle**  
**Ips beetles**



Trees killed by mountain pine beetle.

Pines are attacked by several bark beetles including mountain pine beetle, red turpentine beetle and ips beetles. These beetles feed on the inner bark, creating tunnels that etch the surface of the wood. Bark beetles also carry bluestain fungi, which colonize the sapwood and stain it blue-gray. The tunneling and fungi affect the flow of water, nutrients and sugars in trees, often killing them. Trees stressed by drought, overcrowding, root injury or fire are most susceptible to attack by bark beetles.



Bark beetles are tiny insects that feed beneath the bark of trees and transmit bluestain fungi.

## Identification

### Adult beetles

Adult bark beetles differ in the shape of the rear wing covers, which are rounded in mountain pine beetle and red turpentine beetle, but are slightly depressed and edged with spines in ips. Adult beetles also differ slightly in size and color.



**Mountain pine beetle**

- rounded wing covers
- up to 1/3 inch long
- dark brown to black



**Red turpentine beetle**

- rounded wing covers
- 1/4 to 1/2 inch long
- reddish brown



**Ips beetles**

- depressed wing covers with spines
- 1/8 to 1/4 inch long
- reddish brown to black

### Pitch tubes

Trees attacked by mountain pine beetle have white, pink, or brown resin masses (pitch tubes) along the entire trunk. Similar pitch tubes are found on trees attacked by red turpentine beetle, but are found at the base of the trunk. Pitch tubes are usually not present on trees attacked by ips. Reddish brown boring dust may accumulate around the tree and on the bark with all species.



Left: Mountain pine beetle pitch tubes over entire trunk.  
Right: Red turpentine beetle pitch tubes at base of trunk.  
Ips beetles rarely produce pitch tubes.



## Mountain Pine Beetle

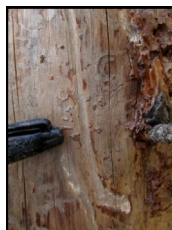
Mountain pine beetle (MPB) prefers to attack stressed trees, but is more aggressive than other bark beetles. Large areas of pine have been killed by MPB in Rocky Mountain states. In Nebraska MPB is found in the Panhandle, and can kill trees that are stressed by drought or root injuries, or when large amounts of infested wood are placed near pines.

**Hosts:** Pines, including ponderosa, lodgepole, Scotch, Austrian, limber, pinyon and bristlecone.

**Life Cycle:** Adult beetles typically emerge in late June to September and attack nearby living trees. The beetles produce chemicals that attract more beetles, and mass attacks of trees are common. Pitch tubes are produced by the tree in an attempt to force out the attacking beetles, and pitch tubes may contain a dead, “pitched out” beetle.



“Pitched out” beetle.



L-shaped tunnel made by MPB.

If a beetle is successful in its attack, it will construct a J- or L-shaped tunnel below the bark at the surface of the wood, mate and lay eggs. Larvae hatch and excavate tunnels perpendicular to the main tunnel. Larvae feed through the fall and continue development in spring. One generation occurs per year.

Trees that are heavily infested can be identified by reddish brown boring dust accumulating around the base of the tree and in bark cracks on the trunk.

Heavily infested trees usually die, although they often remain green through the winter and early spring. Dying trees fade and turn brown by summer, eight to ten months after infestation. Reinfestation of killed trees does not occur.



Reddish brown dust at base of tree. These trees usually die.

### Control:

- ✓ Infested trees should be removed and either chipped, burned or buried before mid-June to kill developing beetles.
- ✓ Infested trees saved for firewood or other purposes should be treated by solarization to kill developing larvae:

**With plastic:** Place logs in a single layer in a sunny location and cover with clear, heavy (6 mil) plastic. Bury edges securely. Cover logs by mid-April and keep covered at least two months.

**Without plastic:** Place logs in a single layer in full sun, preferably on a south-facing slope. Begin treatment in late April and roll logs one third rotation every two to three weeks to expose all surfaces to the sun.

- ✓ Infested logs can also be bark stripped before mid-June to destroy developing larvae.

### Prevention:

- ✓ Improve tree health by thinning dense stands and harvesting mature and overmature trees.
- ✓ Thoroughly water landscape and windbreak trees during periods of drought. Apply 1 inch of water per week (up to 2 inches on sandy soils), and water no more than twice a week.
- ✓ Apply a woodchip mulch over the root zone.
- ✓ Avoid digging, trenching, compacting the soil or other activities that damage tree roots.
- ✓ Treat high-value trees with an insecticide. See back panel for more information.

## Red Turpentine Beetle

Red turpentine beetle is closely related to MPB, but is much less aggressive. Red turpentine beetle will attack stressed or dying trees and freshly cut stumps and logs. The life cycle and hosts are similar to MPB.

**Management:** Maintaining healthy trees will limit attacks. Refer to control and prevention of MPB for specific suggestions. Insecticides can protect high-value trees. See back panel for more information.